WHAT IS CLAIMED IS:

Sub A7 1. A method for routing packets on a linear array of N processors connected in a nearest neighbor configuration, comprising the steps of:

for each end processor of the array, connecting unused outputs to corresponding unused inputs; and

for each axis required to directly route a packet from a source to a destination processor,

determining whether a result of directly sending a packet from an initial processor to a target processor is less than or greater than N/2 moves, respectively, the initial processor being the source processor in a first axis, the target processor being the destination processor in a last axis;

directly sending the packet, when the result is less than N/2 moves; and

indirectly sending the packet so as to wrap around each end processor, when the result is greater than N/2 moves.

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2. The method according to claim 1, wherein packets are routed along the x-axis, then the y-axis, and finally the z-axis.

3. The method according to claim 1, further comprising the step of randomly sending the packet using either of said sending steps, when the result is equal to N/2 moves and N is an even number.

4. The method according to claim 1, wherein said indirectly sending step comprises the step of initially sending the packet in an opposing direction with respect to the target processor, wrapping around a first end processor, proceeding to and wrapping around a second end processor, and proceeding to the target processor.

5. The method according to claim 1, further comprising the step of the target processor receiving the packet upon a second pass thereby, when the packet is sent indirectly.

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6. The method according to claim 1, further comprising the step of adding a 0-bit or a 1-bit to the packet, depending on whether the packet is to be injected into a corresponding axis in the positive or the negative direction, respectively.

7. The method according to claim 6, wherein the packet can only be removed when traveling in the positive direction, if the 0-bit is added thereto.

8. The method according to claim 6, wherein the packet can only be removed when traveling in the negative direction, if the 1-bit is added thereto.

9. The method according to claim 6, further comprising the step of placing the packet in a first queue or a second queue, depending on whether the 0-bit or the 1-bit is added to the packet, respectively.

10. A method for routing packets on a linear array of N processors connected in a nearest neighbor configuration, comprising the steps of:

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for each end processor of the array, connecting unused outputs to corresponding unused inputs;

for each axis required to directly route a packet from a source to a destination processor,

determining whether a result of directly sending a packet from an initial processor to a target processor is greater than N/2 moves, the initial processor being the source processor in a first axis, the target processor being the destination processor in a last axis;

directly sending the packet from the initial processor to the target processor, irrespective of the result; and

indirectly sending at least one of a first dummy packet from and to the initial processor so as to wrap around each end processor, and a second dummy packet from and to the target processor so as to wrap around each end processor, when the result is greater than N/2 moves.

11. The method according to claim 10, wherein the first dummy message is indirectly sent in an initially opposing direction with respect to the target processor.

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12. The method according to claim 10, wherein the second dummy packet is indirectly in an initially same direction as the data packet.

13. The method according to claim 10, further comprising the step of discarding the first dummy packet, upon the initial processor receiving the first dummy packet.

14. The method according to claim 10, wherein said step of indirectly sending the second dummy packet is performed upon the target processor receiving the data packet.

15. The method according to claim 10, further comprising the step of discarding the second dummy packet, upon the target processor receiving the second dummy packet.

16. The method according to claim 10, wherein the first dummy packet is sent at substantially a same time as the data packet.

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17. The method according to claim 10, wherein the first dummy packet is sent when a transmission slot is available for the initial processor.

18. The method according to claim 10, further comprising the step of adding a dummy field to a given data packet that indicates to a corresponding target processor that a given dummy packet is to be created upon receipt of the given data packet, when a result of directly sending the given data packet from a corresponding initial processor to the corresponding target processor is greater than N/2 moves.

19. The method according to claim 10, further comprising the step of adding a dummy field to the data packet that indicates to the target processor that the second dummy packet is to be created upon receipt of the data packet, when the result is greater than N/2 moves.

20. The method according to claim 10, further comprising the steps of:

storing a last packet that one of passed through the

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initial processor or originated from the initial processor; and

creating the first dummy packet from the last packet to reduce energy consumption resulting from at least one of voltage and current switching.

21. The method according to claim 10, further comprising the steps of:

storing a last packet that one of passed through the target processor or originated from the target processor; and

creating the second dummy packet from the last packet to reduce energy consumption resulting from at least one of voltage and current switching.